Digital Learning Management using OpenAI ChatGPT: A Systematic Literature Review

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Abstract. Several studies have investigated digital learning management, but few did so, using OpenAI ChatGPT together with a systematic literature review. The research reported here, aimed to explore the current literature related to the concept, use, and impact of OpenAI ChatGPT. The Systematic Literature Review (SLR) and Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) methods were applied in this research with the stages of identification, screening, eligibility, and inclusion assisted by the Publish or Perish 7, VOSviewer 1.6.18, and NVIVO 12 Plus applications. The findings of Scopus-indexed articles amounted to 2,852 pieces which were filtered into 51 pieces according to themes. The 51 articles were analysed according to the specified topics through the NVIVO 12 Plus application, and the results are presented here. The findings indicate that digital learning management is an online-based learning management system, e-learning, using LMS, AI, and ChatGPT in learning activities from elementary school to university. ChatGPT fosters academic performance, text preparation, curriculum development, compiling academic papers and texts, answering cross-cutting problems, assisting research, assisting educational administration, and using assessment tools in medical education. ChatGPT has positive and negative impacts of which the education community must take cognisance. Thus, future research needs to explore digital learning management based on OpenAI ChatGPT in various cross-disciplines and from various perspectives for comparative results and triangulation.

Keywords: Digital Learning Management; OpenAI ChatGPT; Systematic Literature Review

1. Introduction

Currently, there is a shift from manual learning management towards digital; one of the real manifestations is the emergence of ChatGPT as an artificial intelligence product that is utilized in learning. During 2022-2023 several researchers worldwide have explored digital learning management across disciplines using ChatGPT artificial intelligence in education and learning. These studies included the integration of management and digital technology for Indonesia's educational progress (Sumarno, 2023), learning management systems in learning assessment for operations management courses (Strakos et al., 2023), integration of artificial intelligence (AI) ChatGPT in university students in Thailand (Fuchs & Aguilos, 2023), a survey of knowledge, attitudes, and practices of teachers in the Philippines, using ChatGPT (Robledo et al., 2023), and the views of higher education stakeholders regarding the ethics of using AI in distance learning (Holmes et al., 2023). While research on the topic of digital learning management using artificial intelligence ChatGPT with systematic literature review (SLR) techniques and similar ones found research on the implementation of AI for health care with SLR (Loh et al., 2022), AI in machine learning with a bibliometric review (Shamima et al., 2022), a systematic review of artificial intelligence in midwifery and nursing (Siobhán O'Connor et al., 2022), bibliometric and content analysis in online learning in management education (Ng et al., 2023), a systematic review of digital learning theories with e-Learning for nursing and midwifery courses (Siobhan O'Connor et al., 2023), review and taxonomy of ChatGPT in healthcare (Jianning Li et al., 2023), review and taxonomy of ChatGPT in healthcare (Prananta et al., 2023), impact of ChatGPT implementation for students with SLR techniques (Renato et al., 2023), use of ChatGPT in software companies with an initial systematic literature review (Pattyn, 2023), SLR on Chatbot implications for customer satisfaction (Daza et al., 2023), research on visualization and AI trends over the past decade (Prahani et al., 2023), research into the impact of ChatGPT use in education using systematic review techniques (Montenegro-Rueda et al., 2023), and SLR on ethics in learning using ChatGPT (Vargas-Murillo et al., 2023). Among these studies, no research has been found on digital learning management using OpenAI ChatGPT in education with SLR techniques. Therefore, research on the topic is needed in order to reveal the concept, use and impact of digital learning management using OpenAI ChatGPT in education with SLR techniques.

It is quite surprising that ChatGPT continues to be popular and is even predicted to beat the Google company. Since its launch in 2022, the number of ChatGPT users worldwide has continued to rise. In January 2023 there were 616 million users; in February 2023, 1 billion; and by August 2023, there were 1.8 billion ChatGPT users (Korkmaz et al., 2023; Koc et al., 2023; Skjuve et al., 2023). This caused concern among global scholars and scientists that the emergence of ChatGPT might exceed the swiftness of lecturers' intelligence and responses, due to the features of ChatGPT being more diverse. In addition to presenting information quickly and accurately, ChatGPT offers writing services, providing science literature, creating academic texts and non-academic texts to coding, making this type of AI more popular as the number of users increases (Haman & Školník, 2023). This phenomenon eventually might usurp the scientific authority

of scholars, scientists, lecturers, teachers, educators, or mentors in transforming information into knowledge. Scientists fear this phenomenon because it marks academics' "death of expertise", as it becomes captured by technological products and artificial intelligence (Nichols, 2017; Pulliam, 2017). The reality, however, is that not all scholars and institutions worldwide share this concern, because ChatGPT is used as a means, tool, and medium that foster learning across disciplines from elementary school to university levels (Strzelecki, 2023; Firaina & Sulisworo, 2023). This indicates that using ChatGPT in education is still being debated. The reality, however, is that educated learners, teachers, students, and lecturers in higher education use ChatGPT for learning purposes.

The debate about using ChatGPT and not using it is ongoing, as indicated by several reports, such as research examining the controversy over the use of ChatGPT in academic publications (Curtis, 2023), educational disruption due to using ChatGPT in nursing education (Castonguay et al., 2023), the potential of ChatGPT to replace teachers and human language, and the ethical implications of implementing machine-learning systems in text production (Risang & Mukarto, 2023), the friends and foes controversy in the use of ChatGPT among corpus language experts (Lin, 2023), and research on the movement away from ChatGPT in structured learning (Khaddage & Flintoff, 2023). These controversies need to be examined on a broader scale by tracing recent research on digital learning management using ChatGPT in education.

The research reported here was aimed at exploring the current literature related to the concept, use, and impact of using OpenAI ChatGPT, specifically on the following;
1) What does the concept *digital learning management* using OpenAI ChatGPT mean?
2) How is OpenAI ChatGPT used in education?
3) What is the impact of using OpenAI ChatGPT in education?

2. Literature Review
2.1 Digital Learning Management
Digital learning management is a series of activities in the process of planning, implementing, and assessing or evaluating digital-based learning to make learning successful through approaches, models, media, techniques, and digital-based learning tools, which usually are developed in the form of a Learning Management System (LMS) (Unwin et al., 2010; Dampson et al., 2020; Turnbull et al., 2020; Abdullah & Omar, 2022). Digital learning management is the management of learning with technology and digital platforms that teachers must use in this digital era, from planning and implementation right through to evaluation. Educators must be able to redesign subjects well to be taught with digital technology because the one who organizes is not the principal but the educator himself (Rizal et al., 2021; Ratten, 2023). This scope of digital learning management leads to the use of digital technology, tools, and AI that are planned, implemented, and evaluated by educationists to make learning successful.

In this context, the development of AI is very rapid, including the emergence of Artificial Intelligence Internet of Things (AIoT), which integrates the intercommunity of several systems and networks through intelligent objects into the study of digital learning management (Seng et al., 2022). AI or AIoT is more about transferring data and knowledge through data-based computing, storage, and transmission effectively and efficiently (Guo et al., 2022). The scope of digital learning is abundant by utilizing many tools and ICTs, such as big data, the Internet of Things (IoT), blockchain, AI, and the like (Joey Li et al., 2022). In the context of this research, the meaning of digital learning management is limited to OpenAI ChatGPT in education and learning, which examines the concept, features, and impact of using ChatGPT.

2.2 AI and ChatGPT in Education
AI in education is a digital technology system designed with computer systems that resemble human intelligence capabilities and can be used to assist students and teachers in learning (Pan & Zhang, 2023). AI provides innovation in online learning that must be balanced with teacher technical skills, teacher instruction, gamification, and ethical use (Uunona & Goosen, 2023). AI is an AI product that can be applied in education and learning practices, such as AI Chatbots, ChatGPT, and others (Gaber et al., 2023). The types of AI developing in the world vary, but the most popular is the Generative Pre-training Transformer (ChatGPT), an AI with a chatbot format (Pari-Bedoya et al., 2023).

ChatGPT is used for various purposes, from finding information, writing, and drafting academic papers to learning. ChatGPT was released on 30 November 2022, and underwent many revisions until its stable version was made available by OpenAI, a company affiliated with Microsoft Corp, on 24 May, 2023 (Van Dis et al., 2023). The use of ChatGPT has expanded with the complex needs of the academic community. In addition to information-seeking activities, ChatGPT assists in writing and editing scientific articles, improving writing skills, linguistic assistance, self-study, doing assignments, answering problems and questions in teacher assignments, and others. However, ChatGPT has the disadvantage of not replacing the teacher's position (Chan & Tsi, 2023; Grassini, 2023). Chat, or chat conducted through ChatGPT with a robotic system, will not replace the teacher as a human being and a profession that educates students using reason, mind, feelings, and conscience (Ibda, Syamsi, et al., 2023; Ausat et al., 2023). In this research, the meaning of OpenAI ChatGPT is limited to the concept, its use, and a focus from the perspective of digital learning management.

3. Methodology
3.1. Research Design
For this research on digital learning management using OpenAI ChatGPT the SLR method was applied, adopting the Kitchenham model to uncover findings, studies, and an analysis of the concept of digital learning management using OpenAI ChatGPT (Kitchenham, 2007; Ma'arif et al., 2023). The SLR stage starts with identifying updated published literature compatible with digital learning management using OpenAI ChatGPT in terms of concept, usage, and impact on Scopus databases. The Preferred Reporting Items for Systematic Reviews and

Meta-Analyses (PRISMA) technique was used to assist the SLR procedure through identification, screening, testing eligibility, and inclusion of data, after which analysis was carried out and the findings are presented in descriptive form (see Ibda, Al-Hakim et al., 2023). The stages of identification, screening, eligibility, and inclusion of the findings of recent articles indexed by Scopus refer to the PRISMA technique.

3.2 Inclusion and Exclusion Criteria for Selection of Publications

Researchers determined eight criteria for the selection of articles (see Tantowi et al., 2023). (i) The articles were peer-reviewed scientific articles. Literature findings in papers, book chapters, conference proceedings, research reports, books, dissertations, and theses were not used. (ii) The articles were indexed on Scopus databases. (iii) The articles were available on digital learning management systems by using OpenAI ChatGPT. (iv) Articles werelimited to publications dated 2022-2023. (v) Articles were in English. (vi) For article searches we only used the Publish or Perish 7 application. (vii) The literature used comprised complete PDFs. (viii) The articles used, all were published in open-access journals.

3.3 Screening and Eligibility Assessment for Data Analysis

At this stage, on October 10, 2023, researchers screened literature findings from Scopus through the *Publish or Perish 7* application. Article screening was based on the title-abstract-keyword aspect. Different keywords determined the keywords for the search; this was done to select sufficient articles. The search findings of the Scopus database rendered 2,852 published articles for 2022-2023. The details are provided in Table 1 below.

**Table 1: Findings of articles from the Scopus database**

	Keyword	Quantity
1	Learning management	200 articles
2	Digital learning management	200 articles
3	Digital learning management in education	200 articles
4	Digital learning management using artificial intelligence	200 articles
5	ChatGPT	200 articles
6	ChatGPT in education	200 articles
7	Using ChatGPT	200 articles
8	Impact of using ChatGPT	200 articles
9	Learning with ChatGPT	200 articles
10	ChatGPT system	200 articles
11	ChatGPT management	147 articles
12	ChatGPT feature	78 articles
13	Artificial intelligence	200 articles
14	Artificial intelligence in education	200 articles
15	Artificial intelligence ChatGPT	200 articles
	Quantity	2.852 articles

The findings from the search of 2,852 articles (see Table 1) were not all selected and reviewed. However, the same articles were not used, and in the next step, the final stage, 51 articles were selected and entered into the Mendeley application version 1.19.8, and then saved in the form of RIS. In order to map the initial

network of theme relevance, the RIS file from the Mendeley application was entered into the VOSviewer, application version 1.6.18. A number of steps need to be followed in entering the RIS file into a VOSviewer:

    i.   Prepare the RIS file.
    ii. Create a map based on bibliographic data.
    iii. Read data from the reference manager file.
    iv. Select a file from a folder on the PC.
    v.   Choose the type of analysis and counting method, namely the type of analysis: co-occurrence, unit of analysis, keywords, and counting method: complete counting.
    vi. Verify selected keywords.
    vii.Finalize and present.

Based on the results of the initial analysis of thematic associations, the theme of digital learning management using AI ChatGPT has a very complex association pattern (see Figure 1) in terms of the network visualization below.
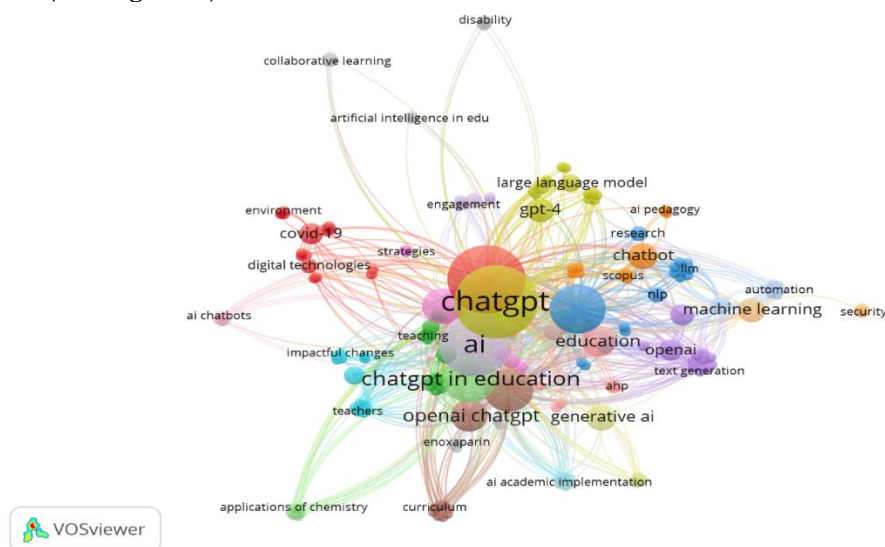

Figure 1. Initial network visualization

Figure 1 shows that the study of digital learning management using OpenAI ChatGPT is closely related to a number of themes such as *ChatGPT, digital learning management, artificial intelligence, AI, ChatGPT in education, chatbot, OpenAI ChatGPT, generative AI, Open AI, GPT-4, education, ethics, learning, NLP,* and *applications in education*. Some keywords that have a distant connection to the theme of the study are *AI academic implementation, applications of chemistry, communication/writing, AI Chatbots, Covid-19, digital technology, environment, disability, authentication, collaborative learning, artificial intelligence in education, security,* and *critical thinking*, etc.

3.4 PRISMA Flow Diagram
The PRISMA flowchart is applied in the article search process through four schemes, namely identification, screening, eligibility, and inclusion, which can be seen in Figure 2 below.
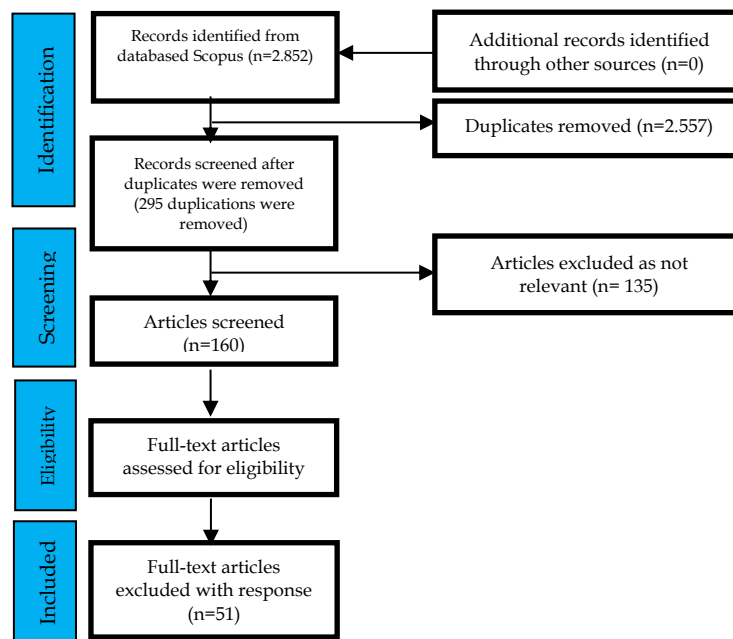
Figure 2: PRISMA Flow Diagram for Systematic Review (Topouzelis et al., 2021).

At the identification stage, 2,852 Scopus-indexed articles were found with the help of the *Publish or Perish 7* application (see Table 1). At the screening stage, the articles were checked for similarity according to keywords, and 2,557 similar articles were found, and the remaining 295 articles were selected. Determination of similarity does not refer to databases; the search here only uses Scopus databases, so the determination of similarity was reviewed from the keywords used. From the screening stage, 135 irrelevant articles were discarded, and 160 articles were selected to be used in the next stage. At the eligibility stage, 85 articles were selected for full-text reading, while 75 articles were discarded. From the articles included, 51 articles were selected from the 85 articles with reference to research questions in terms of title-abstract-keywords and article substance, while the remaining 34 articles were not used.

In the next step, researchers entered all articles that had been saved in RIF format in Mendeley into the Nvivo 12 Plus application. The analysis and review stages in the Nvivo 12 Plus application begin with opening the NVivo 12 Plus application and preparing the RIS file, creating a Blank Project, and entering the title, "Digital Learning Management". The file was saved in the PC browser. The next step was to create file names for the project in Files, Nodes, and Cases. In the file, the RIS file was imported in the Mendeley menu by selecting the Author and Year menu, and the created files in the menu were saved in the file that had been named Digital Learning Management. When all inputs had been concluded, all documents were blocked, and an auto-code was created by selecting the identified theme. When the next step appeared in the file to select nodes or cases, the relevant themes were selected according to the three research questions and keywords, namely digital learning management, AI, Chatboots, and ChatGPT. In the next step, the researcher selected the text with the code paragraph menu aimed at the results being presented quickly. In the next step, the node results were saved in the Digital Learning Management file, and the node stage ended.

Filling in the Cases, the researcher returned to the file menu and all files to be blocked, and selected the *Create As-Create* as Cases menu, and selected the Cases file menu named "Digital Learning Management". When the Cases were filled in, the next step was to go to the Create menu and click the Framework Matrix menu. In the General menu, the file "Digital Learning Management" was written. On the Rows menu, the Select menu was selected, and the file on Cases, "Digital Learning Management", also was selected. When that input had been done, I moved to the Columns menu and selected the node, "Digital Learning Management". When it had been put in, I clicked the OK menu, and the description results of 51 articles appeared according to the name and year categories. In order to get the node result text, the Auto Summarize menu was selected. In the next step, when all the texts had been put in, the author entered the findings according to the relevance of the research question.

4. Results

In this section, the findings reported in 51 articles are presented according to journals (name, volume, edition, year), author name, methodology, country, and relevance to the research question (RQ), namely 5.1 *Digital Learning Management Concept Using OpenAI ChatGPT*, 5.2 *Use of OpenAI ChatGPT in education*, and 5.3 *What is the Impact of Using OpenAI ChatGPT in Education* (see Table 2). In the columns *Journals* and *Authors*, the title of the journal, as well as the volume, edition, and year of publication are given, followed (in the next column) by the name(s) of the author(s). The methodology column provides a description of the approach/method/model/type of research applied in the reviewed article. In the column, *Country,* the country in which the research was done, is given. In the RQ column, the relevance of the article to the research question posed in this research is described.

Table 2: Findings of 51 articles selected from Scopus databases

No	Journals	Authors	Methodology	Country	RQ
1	*Peer J Computer Science* 8 2022	(Kaddoura et al., 2022)	A systematic review	Several countries	5.1
2	*Automation in Construction* 141 (2022)	(Baduge et al., 2022)	State-of-the-art review	Australia	5.1
3	*Sustainability* 14 6 2022	(Yu et al., 2022)	A rapid evidence assessment review method	Several countries	5.1
4	*International Journal of Evaluation and Research in Education* Vol. 11, No. 4 2022	(Ahmad et al., 2022)	Case study	Jordan	5.1
5	*Education Sciences* 12 784 2022	(Akour & Alenezi, 2022)	Investigative Research	Saudi Arabia	5.2
6	*Sustainability* 14, 5195, 2022	(Sobaih et al., 2022)	Quantitative studies	Egypt	5.2
7	*Education and Information Technologies* 27 (2022)	(Hashim et al., 2022)	Qualitative model	Several countries	5.3
8	*International Journal of Learning, Teaching and*	(Yusof et al., 2022)	A survey method	Malaysia	5.2

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9	*Higher Education for the Future* 9 (1) 2022	(Veluvali & Surisetti, 2022)	A Review	India	5.1
10	*International Journal of Learning, Teaching and Educational Research,* Vol. 21, No. 9 2022	(A. Rahman, 2022)	A case investigation	India	5.3
11	*Sustainability* 15 2023	(Chang et al., 2023)	Exploratory Research	Canada	5.1
12	*Journal of Applied Learning & Teaching* Vol.6 No.1 (2023)	(Rasul et al., 2023)	Qualitative Study	Australia	5.3
13	*International Journal of Educational Technology in Higher Education* 20 1 2023	(Chan, 2023)	Quantitative and qualitative research	Hong Kong	5.1
14	*Innovations in Education and Teaching International,* Mar 2023	(Farrokhnia et al., 2023)	SWOT Research	Netherlands	5.3
15	*International Journal of Learning, Teaching and Educational Research* Vol. 22, No. 7 2023	(Chamorro-Atalaya et al., 2023)	A Bibliometric Analysis	Several countries	5.1
16	*Education Sciences* 13, 410, 2023	(Lo, 2023)	A Rapid Review	Several countries	5.3
17	*Journal of Hospitality, Leisure, Sport & Tourism Education,* Vol. 33 2023	(Keiper et al., 2023)	A Generic qualitative inquiry	North America	5.3
18	*International Journal of Artificial Intelligence in Education* 2023	(De-Winter, 2023)	Quantitative	Netherlands	5.3
19	*Medical Education Online,* 28:1 2023	(Moldt et al., 2023)	Qualitative	Germany	5.2
20	*International Journal of Learning, Teaching and Educational Research* Vol. 22, No. 7 2023	(Renato et al., 2023)	SLR	Several countries	5.2
21	*Pakistan Journal of Medical Sciences* Vol. 39 No. 2 2023	(Khan et al., 2023)	Qualitative	Pakistan	5.2
22	*Post-digital Science and Education,* 2023	(Costello, 2023)	Qualitative	Ireland	5.3
23	*Applied Sciences* 13, 6039, 2023	(Sánchez-Ruiz et al., 2023)	Survey Study	Spain	5.3
24	*Applied Sciences* 13, 5783, 2023	(M. Rahman & Watanobe, 2023)	Survey Research and Analysis	Japan	5.2
25	*Contemporary Educational Technology,* 15 (2) 2023	(Halaweh, 2023)	Qualitative	United Arab Emirates	5.2
26	*Journal of Applied Learning & Teaching,* Vol. 6 No. 1 (2023)	(Sullivan et al., 2023)	Content analysis	Australia, New Zealand, United States, and United Kingdom.	5.3

27	*Contemporary Educational Technology*, 15 (3) 2023	(Bitzenbauer, 2023)	One-group pretest-post-test design	Germany	5.3
28	*International Journal of Emerging Technologies in Learning (iJET)*, 18 (17) 2023	(Fiialka et al., 2023)	A survey method	Ukrainian	5.3
29	*Journal of Chinese Economic and Business Studies*, 21, 2 2023	(Singh & Singh, 2023)	Systematic Review	Several countries	5.1
30	*Healthcare*, 11, 887 2023	(Sallam, 2023)	Systematic Review	Several countries	5.1
31	*Cogent Education*, 10, 2 2023	(Pradana et al., 2023)	A literature review and bibliometric analysis	Several countries	5.3
32	*Journal of Chemical Education*, 100, 2023	(Fergus et al., 2023)	Evaluation Research	United Kingdom	5.3
33	*Journal of Science Education and Technology* 32 (2023)	(Cooper, 2023)	Exploratory research	Australia	5.2
34	*Przestrzen Spoleczna* 23 (1) 2023	(Muñoz et al., 2023)	Investigational Research	Perú	5.1
35	*International Journal of Neutrosophic Science (IJNS)* Vol. 20, No. 04 2023	(Alnaqbi & Fouda, 2023)	MCDA method	United Arab Emirates	5.2
36	*RELC Journal* 54 (1) 2023	(Moorhouse et al., 2023)	Mixed-method survey	Hong Kong	5.1
37	*Biology of Sport*, Vol. 40 No. 2, 2023	(Dergaa et al., 2023)	Literature review	Several countries	5.3
38	*International Journal of Learning, Teaching and Educational Research* Vol. 22, No. 6, 2023	(Chaka, 2023)	Exploratory research	South Africa	5.1
39	*Education Sciences*, 13, 150 2023	(Thurzo et al., 2023)	Literature Review	Several countries	5.2
40	*Journal français d'ophtalmologie* 46 7 (2023)	(Panthier & Gatinel, 2023)	Comprehensive study	France	5.2
41	*Interactive Learning Environments* 2023	(Chiu, 2023)	Survey Study	Hong Kong	5.2
42	*Surgical and Radiologic Anatomy* 45 (2023)	(Totlis et al., 2023)	Interview Research	Greece	5.2
43	*Journal of Applied Learning & Teaching* Vol.6 No.1 (2023)	(Firat, 2023)	Exploratory Research	Australia, Sweden, Canada, and Turkey	5.3
44	*Smart Learning Environments*, Vol. 10, 15 (2023)	(Tlili et al., 2023)	Case study approach (qualitative)	China	5.1
45	*Journal of Chemical Education* 100, 2023	(Emenike & Emenike, 2023)	Identification Study	United States	5.1
46	*Journal of Applied Learning & Teaching* Vol.6 No.1 (2023)	(Rudolph et al., 2023)	Comparative Method	Singapore	5.3
47	*Educational Process International Journal* 12, Issue 2 (2023)	(Karakose, 2023)	Descriptive Analysis	Turkey	5.3

48	*International Journal of Evaluation and Research in Education (IJERE)* Vol. 12, No. 2, 2023	(Razak et al., 2023)	Systematic review	Several countries	5.1
49	*ECNU Review of Education* 6(3) 2023	(Su & Yang, 2023)	IDEE theoretical framework method	Hong Kong	5.1
50	*Indian Dermatology Online Journal* 14, 2023	(Mondal et al., 2023)	Cross-sectional observational study	India	5.1
51	*International Journal of Learning, Teaching and Educational Research* Vol. 22, No. 8 2023	(Zekaj, 2023)	SLR	Several countries	5.2

5. Discussion

5.1 Digital Learning Management concept using AI ChatGPT

Digital learning management is a cyber-based learning management system, digital e-learning (Ahmad et al., 2022), which is used in machine-assisted learning, scheduling, supervision, cheating detection and assessment, artificial intelligence (Kaddoura et al., 2022), IoT, Chatbots, robots, augmented reality for deep and digital-based learning (Baduge et al., 2022), and using generative artificial intelligence, ChatGPT (Emenike & Emenike, 2023). Digital learning management nowadays is not only e-learning, augmented reality, and virtual reality, but also refers to artificial intelligence, which has become a new tool in digital learning (Razak et al., 2023). To facilitate the implementation of digital learning management, LMSs are used (Veluvali & Surisetti, 2022), such as MOOCs, Lernraum Berlin Platform, MS Teams, Tencent Conference, Zoom, Webex Platform, and OpenAI ChatGPT or AI ChatGPT (Yu et al., 2022). In digital learning settings, ChatGPT AI chatbot is more popular than YouChat and Chatsonic (Chaka, 2023). ChatGPT is set up as a tool for digital learning that provides answering facilities and presents information according to learner needs (Muñoz et al., 2023), which can be done with E-Classroom, synchronous or asynchronous learning (Moorhouse et al., 2023).

ChatGPT in digital learning management refers to an intelligence-based Chatbots with a large conversational language model (LLM) (Sallam, 2023), belonging to the category of educational Chatbots for universities (Chamorro-Atalaya et al., 2023), interactive conversations, or conversational agents designed to provide learning experiences to students (Chang et al., 2023) developed by Open AI (*Openai.com*) (Mondal et al., 2023). ChatGPT works with a transformer algorithm through preprocessing, encoding, decoding, and postprocessing stages (Su & Yang, 2023). ChatGPT is classified as a generative AI, designed to produce natural text language. The development of ChatGPT from GPT, GPT-3.5, and GPT-4 (Tlili et al., 2023) is proof that artificial intelligence can be instructed to perform the same intellectual tasks as human (Chan, 2023), and is proof that education cannot be separated from intelligent and practical digital technology (Singh & Singh, 2023).

The findings about ChatGPT's AI concept are important for teachers, students, and educational researchers to know. The reason is that ChatGPT, as an AI product, influences the concept of digital-based learning management and

becomes a genre in specific learning contexts. The ever-changing development of ChatGPT proves that technology is very inclusive and adapts to the times. Therefore, all education activists must know the concept of AI at large, and ChatGPT itself.

5.2 Use of AI ChatGPT in Education

AI ChatGPT is used from elementary school to college. In higher education, the application of ChatGPT is a form of digital transformation that requires much preparation, skills, digital literacy (Akour & Alenezi, 2022), adequate academic performance, social-media networking (Sobaih et al., 2022), social-network systems (Yusof et al., 2022), text drafting, data processing, and curriculum development (Renato et al., 2023). In the world of education and research, ChatGPT is used as a tool to organize writing, answer cross-cutting questions (Alnaqbi & Fouda, 2023), to answer complex topics, in language training, virtual tutoring, programming exercises, and to assist in the research process (Rahman & Watanobe, 2023), assist with writing, research, academic publications (Halaweh, 2023), and manuscript editing (Cooper, 2023). ChatGPT is used by academics and policymakers to help solve educational problems and make educational policies (Pradana et al., 2023), while in Hong Kong, teachers and principals use OpenAI ChatGPT to help with learning, school administration and assessment (Chiu, 2023). The use of AI in education is not just a tool but must transform education as a cognitive process, integration of educational theory, and pedagogical practice (Zekaj, 2023).

The University of Luebeck and the University Hospital of Tuebingen incorporated AI ChatGPT as medical Chatbots in the medical education curriculum designed for all medical students to communicate with AI-based patients (Moldt et al., 2023). ChatGPT was used as a media knowledge assessment tool in France (Panthier & Gatinel, 2023), integrated into the curriculum for the purpose of strengthening care planning, telemedicine screening, diagnostics, and management (Thurzo et al., 2023), and in Pakistan for teaching assistance, personalized learning, research assistance, quick access to information, automated scoring, language translation, creating content to facilitate learning, and generating case scenarios (Khan et al., 2023). ChatGPT-4 was implemented as an interactive anatomy tool and quiz medium for medical students in Greece. Although varied, ChatGPT-4 cannot replace human education (Totlis et al., 2023).

The use of ChatGPT in education should be supervised and guided by educators. This is to ensure that the use of AI takes place in a way that is effective, relevant, and safe for the students. It is also important to consider privacy and data security when using this kind of technology in an educational context. This is because, in essence, teachers will not be replaced by any technology, including AI and ChatGPT itself. Therefore, teacher supervision, guidance, and direction are very important when students are delinquent on ChatGPT.

5.3 Impact of Using AI ChatGPT in Education

In general, the use of ChatGPT has both positive and negative impacts. The positive impact is that AI in India is used to assist e-learning and e-assessment,

impacting on grade validity-reliability and student integrity (A. Rahman, 2022), students get a learning experience that is oriented towards meeting the individual needs of the learner (Hashim et al., 2022), for students, the use of ChatGPT has an impact on writing skills, but is balanced with academic ethics to avoid information bias and data falsification (Rasul et al., 2023). ChatGPT makes it easier for students to find answers to educational problems, rather than waiting to use textbooks (Keiper et al., 2023), it helps junior high school learners in English tests in the Netherlands. Using ChatGPT (GPT-3.5), student scores reached an average of 7.3 on a scale of 1-10, and with ChatGPT (GPT-4) they reached an average score of 8.3 (De-Winter, 2023), helping students in Mathematics lectures with problem-solving, and giving them confidence in answering questions (Sánchez-Ruiz et al., 2023), helping high school students in translating Physics terms (Bitzenbauer, 2023), fostering research efficiency (Dergaa et al., 2023), and helping teachers to be creative in using ICT to replace the physical punishment model, doing assignments with printed books, paper, and pencils (Rudolph et al., 2023).

The adverse impact of using ChatGPT is seen in the acquisition of misinformation, in fakes and potential plagiarism (Lo, 2023), obscuring the fundamental truth of information, difficulty in verifying information, truth claims without evidence from literature and research results (Costello, 2023), the weakening of academic integrity, and adjustment of learning systems. Together, these factors make students lazy to read printed books (Sullivan et al., 2023), and the validity of ideas and accurate references in educational research is doubtful. Academics also have to deal with ethics and law, as proving research originality is a severe problem today (Karakose, 2023). ChatGPT gives students an instant mindset, a learning orientation, and to simply pursue graduation and diplomas (Farrokhnia et al., 2023).

Since using ChatGPT, students in the Ukraine have been consuming biased, unverified information, creating misunderstandings, stifling creativity, and decreasing critical thinking skills (Fiialka et al., 2023). Chemistry learning in a pharmaceutical sciences department in the United Kingdom was disrupted because the answers gained from ChatGPT were inappropriate and used out of context, thus the interpretation and quality of student understanding could not be established clearly (Fergus et al., 2023). A total of 21 undergraduate students and 14 Ph.D. students in Sweden, Australia, Turkey, and Canada experienced chaos in assessment because the use of ChatGPT had an impact on the compatibility of assessment and evaluation tools in education. In the end, conventional methods still were applied, but these were not effective in dealing with the answers of the AI (Firat, 2023).

ChatGPT as a tool has both good and bad effects. Although it facilitates learning and assessment, and provides tools for questions and answers, the potential for students/teachers to receive false information or come to incorrect conclusions, and the possibility of plagiarism must also be considered. The use of ChatGPT in education has great potential to enhance the learning experience, but it is important to carefully consider how this technological tool can be integrated properly to support effective and responsible learning processes.

6. Conclusion

Digital learning management is an online-based learning management system, incorporating e-learning, LMS, AI, and ChatGPT in learning activities from elementary school to university. ChatGPT in digital learning management is an intelligence-based Chatbots with a large conversational language model, educational Chatbots, working with transformer algorithms through preprocessing, encoding, decoding, and postprocessing stages that evolve from GPT, GPT-3.5, and GPT-4 to support digital-based learning. AI ChatGPT may be used from elementary school to college. The use of ChatGPT is recommended to improve academic performance, text preparation, curriculum development, compiling academic papers, texts, answering cross-cutting problems, assisting in research, assisting with educational administration, and as assessment tool in medical education. ChatGPT has both positive and negative impacts. Positively, it fosters e-learning and e-assessment, improves writing skills, makes it easier for students to find answers to complete tasks, and improves teachers' creativity. The negative impact of ChatGPT is found in the possibility of using false information, potential plagiarism, misinformation, lazy students not reading books and requiring instant responses, being pragmatists, suffering from learning disorientation and decreased critical thinking skills, and chaos of the assessment system in higher education.

The limitations of this research are found in the researcher only collecting information from current literature, not from field studies, and the study was limited to digital learning management based on OpenAI ChatGPT. Future research needs to explore aspects related to digital learning management based on OpenAI ChatGPT in various cross-disciplines and from various perspectives.

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